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Yield Improvement in Silicon-Germanium Epitaxial Growth

Abstract

A method for determining a SiGe deposition condition so as to improve yield of a semiconductor structure. Fabrication of the semiconductor structure starts with a single-crystal silicon (Si) layer. Then, first and second shallow trench isolation (STI) regions are formed in the single-crystal Si layer. The STI regions sandwich and define a first single-crystal Si region. Next, silicon-germanium (SiGe) mixture is deposited on top of the structure in a SiGe deposition condition so as to grow (i) a second single-crystal silicon region grows up from the top surface of the first single-crystal silicon region and (ii) first and second polysilicon regions from the top surfaces of the first and second STI regions, respectively. By increasing SiGe deposition temperature and/or lowering precursor flow rate until the resulting yield is within a pre-specified range, a satisfactory SiGe deposition condition can be determined for mass production of the structure.